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CASES OF

Trepanation of the Mastoid Process.

BY

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Cases of Trepanation of the Mastoid Process.

CARIES and necrosis are more common in the mastoid than in any other part of the temporal bone. They are more frequently met with in childhood than in adult life, on account of the anatomical relations of the bone, which are highly favourable to the retention and consequent inspissation and putrefaction of the pus formed in suppurative inflammation of the mucous periosteal lining of the mastoid cells. If during the inflammation, ulceration takes place, the bone, deprived of its periosteum, is very soon involved in the molecular necrosis of the tissues, and caries is the result. With caries of the mastoid process, the posterior wall of the meatus is almost always deprived of its periosteum, and perforated. This condition was well marked in two of the cases about to be related, as well as in a specimen I removed from the boy who died of abscess of the brain.

The first case is that of William K——, aged forty-nine, a coachman, who was admitted into the Norfolk and Norwich Hospital under my care in May, 1883, suffering from severe pain over the right side of his face and head; it generally commenced behind the ear and shot upwards, and was of a boring, grinding character; it made him feel very ill, and he looked as if he were in great suffering. Occasionally he had cold shivering fits, alternating with hot feverish attacks. He had a furred tongue and a temperature of 101°. He carried his head on one side, and drawn to the right shoulder. Behind the right ear the parts were red and œdematous; very tender when touched. Pus was being discharged from the meatus; it was seen to issue from a small opening behind the cartilaginous portion of

the auditory canal on its posterior and upper side; a small granulation marked the spot. Hearing was most imperfect; the membrana tympani dull and convex. The man stated that his affection began four months before admission, after driving through a severe snowstorm, in which snow was driven into the right meatus. The same night he experienced pain in the ear. This increased in severity, and a month later the skin behind had become swollen, tender, and inflamed. This state of affairs gradually increased in intensity, besides extending down the neck, until the day of his admission. Ten days later he was placed under the influence of ether, and a straight incision made downwards over the mastoid process. As the tissues were infiltrated with inflammatory products, the incision was carried to a considerable depth before the bone was fully exposed, the condition of which was softer than usual. A small gouge soon penetrated it, and thick pus immediately oozed up. The opening was now carefully enlarged, and its connexion with the auditory tube followed up and also enlarged. The parts were well syringed out with carbolic water, a drainage-tube was placed in the wound and drawn out through the meatus, and cotton-wool placed over all. A few days later an abscess, which had been forming deeply in the neck, opened into the wound and discharged very freely. A month after the operation the wound had healed, the membrana tympani was in a healthy state, and his hearing almost perfect. He was then sent to Yarmouth. In less than a fortnight he returned to the hospital suffering from an attack of erysipelas of the face and head, which rendered him delirious for a week. Eventually he got quite well, and I have seen him many times since. He has expressed himself as being in excellent health, and his hearing good.

REMARKS.—A singular circumstance in connection with this case was the existence of so much disease around and in the mastoid process, without any implication of the tympanic cavity, or membrana tympani. Holz records a case in his ninth volume of the "Archives of Otology," which he calls "Primary Postaural Abscess, without Implication of the Middle Ear;" and two other examples are mentioned in the same volume.

The *second case* was that of a young woman from whose right ear thin fœtid pus was constantly discharging itself. There was a fistulous opening in the upper and posterior wall of the auditory canal, and another over the mastoid

process. A probe could be made to pass from one to the other. She could give no account of the origin of her trouble. The membrana tympani was absent. Whilst under the influence of ether an incision was made over the mastoid, which was softer than it is naturally. All the carious bone was freely gouged away, and the opening extended into the auditory canal, through which a drainage-tube was placed. She recovered well, but had lost her hearing from disorganisation of the tympanum.

The *third case* was that of a schoolmaster in this city, who, when I first visited him, was suffering great pain and uneasiness over the left mastoid; it was severe enough to keep him in bed. No inflammation could be made out, and there was no œdema over the mastoid. The membrana tympani was healthy, and the hearing fairly perfect. For three months I tried every known remedy, both externally and internally, and failed to give him the least relief; and, although there was no external sign of an abscess, I proposed as a last resource to cut down upon and open the mastoid process. To this the patient readily assented. The periosteum was found to be thickened, but not otherwise altered. This was freely incised, and I now attempted to perforate the mastoid with Dr. Buck's trephine. So dense and hard was it that I utterly failed to make the smallest impression on it. Nor was I more fortunate with Marshall's necrotome. I was reluctantly obliged to close the wound. From that day my patient suffered no more pain; the wound healed rapidly, and at the present time—four years from the date of the operation—he is in perfect health, and free from any auditory annoyance.

Remarks.—Dr. Voltolini is the only authority who has directed attention to this peculiar affection, which he represents as "a form of mastoid periostitis undescribed by otological authorities." To him is due the credit of having given a clear and detailed description of this disease. "The ear," he observes, "may remain intact, but may sometimes in the course of the affection participate in the inflammation. The disease begins with severe tearing pains on one or both sides of the head, which extend to the side of the face and teeth." In three cases reported by Dr. Voltolini, all were the result of cold and exposure. In one case, after the use of leeches, which did not diminish the symptoms, a long and deep incision was made over the mastoid. The pain was almost immediately relieved, the patient slept

well, and made a good recovery. Dr. Turnbull* remarks: "A study of these cases (one by Dr. Blake, of Boston, one by Dr. H. Knapp, of New York, and my own) shows the disease to be neither one of the auricle, the external auditory canal, the tympanic cavity, nor the mastoid cells, but one that originates without, and not within, the ear, and one that might progress inwards, but would hardly penetrate deeply."

The next case was that of a boy aged seven years, under my care in the Norwich Hospital, and very kindly transferred to me by Mr. Cadge in December, 1885. He had an attack of scarlet fever five years previously, and from that time had suffered from otorrhœa of the left ear. Three weeks before admission he complained of severe pain in the head, especially about the vertex; he had a peculiar way of looking upwards, and generally carried his head on one side (the right); he used to walk against things as if he had lost his sight, and had occasional attacks of vomiting. He was fairly well nourished, of light complexion, had a vacant expression, was able to read and write, but could do neither now, the sight being so imperfect, so much so that he could not distinguish letters. The pupils were widely dilated, and acted feebly. In walking he proceeded very cautiously and slowly. Was dull and stupid. Had no paralysis, either facial or lateral. There was a free offensive discharge from the left ear, and a tender swelling behind. The membrana tympani and ossicles absent. On January 8th, 1886, he was etherised, and a long deep incision made over the mastoid process. A good deal of pus was found to be lying under the periosteum. The surface of the bone was rough and carious. This was chiseled away, the mastoid cells freely opened, and a communication made into the auditory canal. A drainage-tube was passed into the wound, and out through the meatus. The wound was well syringed with boracic lotion, and the ear covered over with carbolised dressing. Two months later the wound had healed, the discharge had ceased, the boy was less dull, could see well, and run about without fear.

REMARKS.—Of all cases within the domain of surgery, no case is so likely to terminate fatally if left to itself as that of inflammation of the tympanum, whether it be acute or chronic; and no case is so likely to end well as such a one

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* Imperfect Hearing. Philadelphia, 1881.

if operative proceedings are adopted early. An abscess in the immediate vicinity of the brain carries with it grave danger, and the early opening of that abscess is the only protection against the destructive effect of pent-up matter. Surgeons, as a rule, hesitate too long in dealing with abscess of the mastoid process; precious time is thus lost, irreparable mischief is sustained by the structures of the tympanum, and a fatal termination from abscess of the brain, meningitis, or pyæmia, is too frequently the result. On this point Hinton observes: "I have never regretted making the incision, and scarcely ever decided against making it without regretting that I did not." Sir William Dalby says: "No time should ever be lost in providing an escape for pus. Pain and tenderness over the mastoid process should always demand immediate attention, and especially when the tympanic membrane is perforated. If, in addition, there should be any redness or pitting upon pressure, it may be assumed with great confidence that there is pus in the mastoid cells." At the same time, a word of caution on one or two points in connection with this operation may be useful. It is well to remember how near the lateral sinus is; it lies immediately behind the mastoid process; and if this process has become softened from the long retention of pus within its cells, a condition results named by some "caseous degeneration;" the trephine or chisel may readily slip through this into the sinus. As a precautionary measure, the finger-nail, or the point of the scalpel, should be pressed against the bone; and if it does not yield, we may proceed to operate with the gouge or trephine. The form of trephine I like best is that used in America, and known as Dr. Buck's. It is a more manageable instrument than Hinton's, and more under control. I have had fitted to mine a small conical-shaped necrotome, which will be found of great use. Having perforated the bone with the trephine, the necrotome can be used to enlarge the opening; but should the bone be soft, Volkmann's scoop is unquestionably the safest and best instrument with which to scoop away all carious bone.

Abscess of the Brain in connection with Caries of the Internal Ear.

THE subject from which this specimen* was removed, was a boy a little over ten years of age. When two years old he fell down some cellar stairs, and struck his forehead against the opposite wall; a large swelling appeared, which quickly subsided, and in a day or two he was apparently quite well. At the age of four years he fell a second time down the same stairs, and received a severe blow on the back of his head. He was very ill for several days, and then seemed to get well; that is, he made no complaint of pain in either ear, and no hæmorrhage took place from either ear, at the time or subsequently. He was never known either to feel giddy, or reel about, or vomit his food, or feel faint; but during the last four years of his life he was not infrequently seized with fits of delirium, and was noticed to be grasping at imaginary objects. He never had scarlet fever, but measles he had when five years old. At eight years of age discharge of pus occasionally took place from the right ear of a very offensive character. This continued to the time of his death. He was perfectly deaf with this ear.

The fatal illness commenced seven weeks before he died. It began with persistent pain in the affected ear and right side of his head, followed in ten days by the formation of an abscess behind the ear, which opened into the auditory canal. When I visited him a few days before he died, in consultation with Mr. David Penrice, he was lying coiled up in bed, shrieking every few minutes. He complained of a stabbing pain in the head. An abscess existed over

* Paper read at a Meeting of the Norwich Medico-Chirurgical Society.

the mastoid process, and was discharging itself into the auditory canal, just within the meatus extemus. The pus was highly offensive, and was running from him continuously. He was sensible enough to answer questions, and if he moved his head, it was managed with a great amount of caution.

Examination after death disclosed distention of the right ventricle of the cerebrum, with a considerable amount of offensive watery pus, which was also found lying at the base. On the superior surface of the petrous portion of the right temporal bone, there existed an irregular ulcerated opening, the size of a threepenny piece. A probe readily passed through this into the abscess behind the ear. At a point on the surface of the hemisphere opposite this orifice, was a softened spot, the entrance to a canal through the substance of the brain into the ventricle, from which pus was enabled to find an exit to the ear.

The temporal bone, after its removal, showed complete destruction of the tympanum and mastoid cells. A small ulcerated opening existed on the external surface of the mastoid process; this communicated with the abscess behind the ear. There was another irregular ulcerated aperture in the superior wall of the auditory canal. Pus had passed through this, and had pushed before it the cartilaginous portion of the auditory canal, and this portion—quite the upper segment—laid across the middle of the meatus extemus, and in the centre of it was a round opening, through which pus had passed outwards. The membrana tympani and ossicles were absent.

REMARKS.—The large amount of destructive disease in this case, which eventually led to abscess of the brain and death, must have been unquestionably caused by one or both of the accidents which the boy met with in the early period of his life, and although no trace of fracture could be seen, a blow on the head has been found to be quite sufficient to give rise to chronic disease of the ear. Roosa, in a table of forty cases of cerebral abscess in connection with ear disease, mentions that of a child aged twelve, in whom caries of the ear, with abscess in the middle lobe, followed a severe blow on the head. As a rule, such cases are very rare.